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OF

CEREBRO-SPINAL MENINGITIS

BY

FRANCIS H. WILLIAMS, M.D.

REPRINTED FROM
THE MEDICAL AND SURGICAL REPORTS OF THE
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By Francis H. Williams, M.D.

It is not my intention to consider here the various epidemics of cerebro-spinal meningitis that have occured since 1805 in the United States and other countries, nor the recognition in recent years of a diplococcus as a cause of this serious malady but with the kind permission of the medical staff of the Boston City Hospital, to give an outline of the cases that have entered their services, as well as my own, between January 1, 1897, and December, 1897, seventy-one in all. The records are in many instances incomplete for various reasons; many patients do not speak English or they may be brought to the hospital in an unconscious condition and unaccompanied by friends. The tabulation by localities shows that one part of the city has not been markedly more affected than another. The patients have been youths and adults, as children have been sent to the Children's Hospital. The mortality has been nearly 61 per cent.; forty-nine died; twenty-two recovered.

The disease has been characterized by sudden onset; the most constant symptom has been headache, associated usually with some tenderness to pressure in the neck or pain on movement there or retraction of the neck. Delirium occurred in most of the cases, vomiting was a frequent symptom and strabismus, failure of the pupils to react, nystagmus, diplopia, or optic neuritis have been often noted. The temperature was very irregular, and this want of regularity is quite characteristic of the disease. The pulse in some cases was rapid, in others it was less than normal, and in still others it was slower than the symptoms present would lead one to expect. In nineteen cases there was herpes labialis.

The leucocytes were counted in thirty-two cases, and in twelve of these there were at some period of the disease less than

10,000; this was true in four of the fatal cases, but a subsequent count in three gave a great increase in numbers; in the fourth there was no subsequent count. If, therefore, the leucocyte count when used in the diagnosis of cerebro-spinal meningitis, gives no leucocytosis, a second count should be made. In thirteen cases, more than one count was made and the subsequent count or counts showed a marked increase in the leucocytes in the six fatal cases (three of these have been alluded to above); in the remaining seven that recovered there was a striking decrease in five, no change in one, and in the seventh the decrease was followed by an increase and this again was succeeded by a diminution. These cases indicate that the leucocyte count may sometimes assist in the prognosis.

The serum test for typhoid fever was tried in ten cases and was positive in one only, that of a negro.

Lumbar puncture was done in forty cases, and judging from these this puncture does no harm and it readily establishes the diagnosis when fluid containing the organisms is found; it is sometimes very serviceable for diagnosis as often there is no history and the symptoms may be few. It should be borne in mind that the bacterial examination may give a negative result even in cerebro-spinal meningitis unless the test is made by those who have had much experience. The operation for lumbar puncture, under strict antiseptic precautions, is readily done by using a small trocar to tap the sac surrounding the spinal cord and drawing off some of the fluid; the point of insertion is between the third and fourth lumbar vertebræ. I have usually chosen a point slightly lower than the lowest part of the spinous process of the second lumbar vertebra, and one inch outside of it, and inserted a small sized trocar, somewhat downward and inward to a depth of rather more than two inches. I have always used a trocar instead of a needle, as the latter is liable to be bent or broken off, and is too small to allow the thick pus that is present in some cases to flow through it easily.

The present treatment of the disease is wholly unsatisfactory; but the fact that we have the means of making an early diagnosis in many cases, offers the hope that better treatment may be found.

Date of entrance.	Name.	Age.	Duration.	Onset.	Headache.	Neck.	Vomiting.	Delirium.	Coma.	Convulsions.	Eyes.	Ears.	Paralysis.	Eruptions.	Leucocytosis.	Autopsy.	Lumbar puncture.	Died.	Recovered.	Remarks.
1897 Jan. 2	Jos. P.	27	5 days		+			+	+						2-5th d. 9,000	+		Jan. 5		
Feb. 8	John L.	49	1 day	Alcoholic excess.		Retrac.			+							+		Feb. 10		
" 10	Wm. H.	40	18 "	Headache.	+	Retrac.		+					Right side.			+		Feb. 17		Paralysis day before death.
Mar. 5	John F.	31	14 "	Alcoholic. Malaise.	+	Retrac.						Tender mastoids.			18,800		March 13, dry tap.		Apr. 10	
" 6	Mike M.	17	10 "		+	Pain, retrac.	+	+			Diplopia, ptosis, double optic neuritis.	Deaf in left ear, secondary to mening.			Mar. 8, 8,200 Mar. 11, 16,000 Mar. 15, 22,000		March 15, ℥ij slightly turbid, no pus, mono leucocytes.	Mar. 21		Cephalic cry.
" 9	C. H.	25	1 day	Found unconscious.	+	Retrac.										+		Mar. 21		Musc, rig., struggling, slept after puncture.
" 10	Alfred B.		6 w'ks	Headache, occip. and cerv.	+	Slight retrac.		+			Slight optic neuritis.						March 10, ℥ij turbid, diplococci.		Apr. 10	Tenderness over spine.
" 10	Richard S.	23	10 days	Headache.	+		+	Violent.										Apr. 6		Tuberculin, no reaction.
" 11	Sophie M.	17	2 "	Chill; headache.	+	Pain.	+	+			Diplopia, strabismus, ptosis.				4th dy. 31,000		March 14, ℥ij turbid, diplococci.	Mar. 16		
" 11	Frank R.	23	2 "	Alcohol, stupid.			+	+			Strabismus.		Tongue to left.		7,490		March 20, ℥ij clr. sterile.		Apr. 3	
" 17	Celia McC.	25	4 "	Indef. pain, vomiting.	+	Tender.	+				Nystag., diplopia.		3d–6th nerve.				2 dry taps.	Apr. 2		Epistaxis.
" 18	S. P.	33	18 "		+	Stiff, retrac.		+									March 21, pus cells.	Mar. 22		
" 19	Chas. K.	15	25 "	Headache.	+		+			+	Strabismus, nystag.			Purpuric spots on r. knee, wrist, forearm, elbows. Herpes labialis.			March 20, ℥j turbid, diplococci.	Mar. 22		
" 20	Porter, A. S.	37	7 "	Headache gen. pains.	+		+	+							Mar. 24, 14,000		March 23, ℥iv turbid.		May 17	Well, except some mental symptoms.
" 25	Jessie E.	17	4 "	Headache gen. pains.	+	Pain, retrac.		+	+							+		Mar. 26		
" 30	Martin C.	19	5 "	Headache.	+	Stiff, retrac.	+	+			Sl. optic neuritis.	Deafness from mening.		Herpes labialis.	9,350				Apr. 19	Well.
" 30	Thos. T.	27	8 "	Malaise, headache, delirium.	+	Stiff, retrac.					Strabismus.			Herpes labialis.	April 1, 21,600		April 1, turbid.	Apr. 2		
April 1	Mertie K.	33	3 "	Vomiting, occip. headache	+	Stiff.		+	+		Strabismus.						April 3, no fluid,	Apr. 5		
" 5	Kate G.	15	1 day	Irritable.	+		+	+			Strabismus.					+		Apr. 5		
" 5	Mike M.	35	2 days	Pain back and legs; headache, delirium	+	Retrac.	+										April 6, ℥ij purulent fluid.	Apr. 6		
" 6	Alex. McC.		?								Nystag.	Tender mastoids.				+	April, 9, dry tap.	Apr. 9		
" 17	Art. McK.	24	1 day	Sore throat, headache.	+		+		+							+		Apr. 17		Unconscious, restless.
" 17	John S.	24	3 days	Headache.	+	Stiff.	+	+						Petechiæ l. elbow, buttocks.		+	Sterile.	Apr. 23		
" 18	Pat. O'B.	26	3 days	Severe headache, vomiting.	+	Stiff		+	[illegible]		Ptosis.			Macules. [illegible]			Small amount clear, sterile.		June 26	
" 18	Geo. K.	50	3 "	Delirum				+			Optic neuritis, strabis. no reaction.						April 16, diplococci.	Apr. 20		
" 21	Pet. McG.	29	4 "	Chill, headache, delirium.	+	Retrac.		+								+	April 22, ℥iv turbid, diplococci.	Apr. 23		
" 21	Chris. D.	19	3 "	Headache, chill.	+	Rigid.	+	+				Pain over mastoids.		Herpes lab.			Turbid fluid.		June 8	
" 22	Emma N.	36	10 "	Chill, pain in back, headache.	+	Stiff.		+						Herpes lab.	Apr. 30, 24,500		Diplococci.		June 5	
" 22	Daniel M.	28	4 "	Headache, pain in abdomen, delirum.	+	Stiff, retrac., opisthotonos.		+							Apr. 27, 11,400		3 times, 1 puss cells. 2 diplococ., 3 sterile.		May 22	
" 26	Geo. W.	28	2 "	Headache, vomiting.	+	Rigid, tenderness.	+	+			Conjunctivitis.			Petechiæ over whole body marked.		+	April 28, few drops bloody fluid.	Apr. 29		
" 30	James W.	27	11 "	Sore throat, headache, vomiting.	+	Retrac. rigidity.		+			Sl. nystag. conjunctivitis.						May 2, pus cells.	May 8		
May 4	James C.	16	3 "	Headache, vomiting, vertigo.	+	Retrac. tenderness neck and back.								Herpes labialis.				May 29		
" 7	Andrew H.	27	4 "	Pain in legs, vomiting, nose bleed.	+	Stiff.		+			Ptosis.		Compl r.-sid'd paral.	Herpes labialis.			May 9, 60 cc. turb. diplococci	May 29		
" 12	Thomas D.	40	3 "	Headache, sore throat.	+	Pain, tender.		+			External strabis. r.	Deafn's.		Herpes labialis.			May 13 and 19, dry taps.	May 19		Reflexes absent.
" 14	Cassie McG	23	3 "	Headache, pain in neck.	+	Stiff, pain.											May 15, diplococci.	May 15		Endocarditis.
" 17	John S.	27	7 "	Pain in neck and legs, headache.	+	Pain, stiff.	+	+						Herpes labialis.			May 20, diplococci.	June 3		
" 5	Thomas S.	35	5 "	Pain in back, headache, chills.	+	Stiff.	+							Herpes labialis.			May 7, dry tap.		May 22	
" 17	Henry H.	58	3 "	Headache, vomiting, abd. pain.	+	Stiff, retrac.			+				Right leg.			+	May 18, post mortem, dip.	May 18		
" 21	Everett M.	26	14 "	Pain in back, headache.	+	Stiff.	+							Herpes labialis			May 22, dry tap.		June 26	
" 22	Con'r O'B.	25	2 "	Headache, gen. pains.	+	Stiff.		+			Slight strabis.				May 25, 32,000	+	May 24, diplococci.	May 25		
" 13	Julius E.	58	3 wks	Drowsiness; indef. hist.		Tend'r, stiff.		+			Ptosis, left pupil smaller, neither react.					+		May 19		Hydrocephalus.
" 24	Jane O'C.	13	2 days	Pain in back.		Retrac.	+	+										May 26		
" 30	Wm. B.	17	4 "	Frontal headache	+	Slight retrac. stiff.	+	+			Internal strabismus.						May 31, diplococci.	May 31		
" 30	John McC.	35	6 "	Pain in bones, chill.	+	Pain, stiff.	+										June 2, diplococci.		June 28	Chill on 27th; pulse and temp. rose.
" 31	Eugene L.	37	3 wks	Vomiting, headache, pain in small of back and legs.	+	Stiff. rigid.										+		June 6		
June 8	John L.	29		A week before entrance drank to excess; 3 days before entrance delirious at night.		Stiffness of neck, pain in back.		Mild at entr'ce.			Normal reactions.	3 days before entrance suddenly deaf.		2nd day marked herpes.			2nd day, 12 cc.; cloudy serum. Pus and diplococci.	July 4		
" 11	Tillian B.	30		Semi-conscious at entrance; no history.		Some retraction.		4th day.			Pupils small; no reaction.						4th day, 12 cc.; cloudy fluid.		+	After first week patient improved steadily.
" 12	Martha M.	16		2 days ago headache, yesterday vomiting and retraction. Pain along whole spine.	+	Retraction. Tenderness.					Normal.		June 15, left facial.	Herpes on lips, ears and neck.				June 23		Knee-jerks diminished.
" 17	Frank T.	25		3 days ago, chill, followed by vomiting, almost continuous first night. Then headache, stiffness neck and back, soreness of limbs. Yesterday delirious.	+	Stiffness. Pain on rotation.		+									Post-mortem, 5 cc.; fluid containing diplococci intracell.	June 18		June 18, no indication of serious condition; not delirious. Uncomfortable on account of pain in back and limbs. Suddenly the patient became cyanosed and died in a few minutes.
" 20	Ernest L. W.	27		1 week ago a chill lasting about 1 hour, followed by headache and nausea; next day intense headache, delirious that night. Stiffness of neck and back; soreness in limbs.	+	Pain on movement or pressure.					Normal.			Herpes, labialis, June 17.	June 21, 15,800; June 26, 9,800.				Disch. Aug. 11	No serum reaction. June 28, patient much improved; July 10, severe headache and mild delirium; July 26, patient up for short time; July 30, pain in right knee, some effusion, subsided in about three months.
" 28	Peter M.	24	7 days	Chill and vomiting 7 days ago; 2 chills since; severe occipital headache pain extending down spine. Delirious 3 days before entrance.	+	Slight stiffness.					Normal.				June 29, 11,200; July 9, 14,200.			July 16		Reflexes normal at entrance. Incontinence urine July 5. Head constantly turned to left.
" 29	James G.	25	3½ w'ks	Weakness, headache, vomiting.	+	Stiffness; pain on Flexion.									July 3, 7000				Discharge July 15	
July 5	Laurence H.	38		Delirious.		Normal.					Normal.			Herpes at entrance.	July 8, 15,600		July 18, 6 cc.; cloudy fluid, Pure culture diplococci, intra cell.		+	Pulse rapid, temperature irregular. Discharged Aug. 31, still not clear mentally.
" 6	George E. F.	26	2 days	Vomiting and severe headache.	+						12, d. slight int. strabis.			Herpes labialis.	July 7, 16,400 Aug. 17, 13,400				+	From July 18-24, comatose, high temperature; weak, death expected hourly. July 26, temp. dropped to normal; patient improved. Aug. 7, delirious. From Aug. 22, improved steadily, mentally and physically. Nov. 27, well except bed-sores on heels.
" 6	Jennie T. E.	27		3 days before entrance patient lost child 6 years old of cerebro-spinal meningitis after illness of 12 hours. Patient delirious, pain in back of neck, vomiting since death of child. Did not know she had lost her child until recovery.		Pain.					July 7, Divergent strabis.				July 7, 29,400 July 9, 14,000 July 19, 9,400		July 8, 5 cc.; whitish cloudy fluid, shows diplococci.		+	July 9-14, continued steady improvement. Discharged Aug. 11, well.
" 6	Blanche L.	18		Sick for 2 weeks, delirious most of time. Pain in top of head.	+	Stiff, pain on movement.					Internal strabis. Double optic neuritis.		Taste impared.		15,700			July 24		
" 7	Wm. B. R.	52		Sick one week, delirious at entrance.		Stiff, tenderness.		+	+						July 8, 7,000 July 11, 18,400	+		July 14		Delirious, July 11.
" 9	Salvatore M.	16		15 days ago, chills, headache, fever; 10 days ago severe pain in back of neck, retraction, delirious, unconscious.	+	Retrac. pain on flexion.		+							July 10, 12,000		July 12, 10 cc. clear fluid, small am't gray flocculent sediment.	July 14		
" 12	Mary C.	46		10 days ago nausea and vomiting, occipital headache, pain in back of neck; weak, in bed a few days, then up; took to bed 5 days ago, pains have increased.	+	Pain, tenderness. Rotation and flexian; painful.					Diplopia		Left facial.		July 12, 19,600	+		July 25		Knee-jerks absent. July 18, facial paralysis almost gone. July 20, patient much improved. July 24, patient weaker, rational.
" 24	Josephine H.	32		Vomiting and severe headache since July 22.	+									Herpes labialis.	July 25, 13,800 July 29, 7,400				+	Disch. well, August 14.
" 26	Edward P.	32		July 4, frontal headache. Semi-conscious at entrance, slight stiffness neck.	+	July 30, almost opisthotonos.		+							11,500	+		July 30		Pulse 55 at entrance, temp. 100°. Serum reaction positive (negro).
" 30	Lottie A. M.	32	7 days	7 days ago severe pain in left side. Diarrhoea for three days. 5 days ago severe pain in back of neck and back then severe headache. Vomited several times before entrance.	+	Pain.					Diplopia slight; ptosis both sides.				Aug. 1, 13,200 Aug. 7, 13,300				+	Patient improved steadily after admission. Discharged, August 11, well.
Aug. 2	Thomas R.	36	1 day.	Well till yesterday evening, suddenly dropped back in chair, unconscious, frothed at mouth, cyanotic, this lasted fifteen minutes. Remained unconscious till entrance.							Right pupil smaller than left.		Slight ptosis both eyes.		Aug. 4, 13,000		Post-mortem, pus drawn out.	Aug. 7		Knee-jerks, cremasteric and abdominal reflexes absent.
Sept. 14	Mary T.	17		Well till this morning. Head drawn to right. No tenderness of spine, unconscious since admission.	+	Sept. 15 Resistance to movement.			+						Sep. 15, 12,500		Post-mortem, few pus cells. Culture sterile.	Sept. 15		
" 17	Charlie J.	21		3 days ago severe chill, frontal headache. 2 days ago, chill vomiting, stiffness of neck.	+	Retraction; tenderness.							Oct. 3 Right hemiplegia.	Aug. 18, Herpes labialis	Sep. 17, 11,500 Sep. 18, 15,200 Sep. 20, 12,000 Oct. 1, 17,500			Oct. 1		Aug. 19, tenderness over mastoids. Aug. 18, knee-jerks now absent, have been present till to-day. Sept. 28, several chills.
" 18	Edward B.	25		Went to bed well on 16th, sick during night, unconcious in morning and brought to hospital.		No tenderness, pain on turning.					Divergent strabismus.		Slight right facial.			+	19th 15 cc. cloudy fluid, pus cells containing diplococci.	Sept. 19		Sept. 18, considerable loss of power of right arm and right leg. Until lumbar puncture was made the diagnosis was uncertain.
Oct. 13	John M.	34		Pain in back of head, neck and along spine for two weeks; great tenderness to pressure.	+	Rigidity		Mild							Oct. 13, 16,200 Oct. 23, 16,700 Nov. 4, 7,200				+	Oct 25, patient decidedly worse. Nov. 2, still worse mentally. Nov. 6, much better. Nov. 19, severe pain in back of neck, less rigidity. Delusions. Nov. 25, up a short time; reads newspapers intelligently.
" 23	Pat. M.	19	5 days	Pain in head and back of neck. Vomited once. Head slightly retracted.	+	Tenderness. Rigid.	+	Mild			Normal			Herpes labialis	Oct. 24, 6,600 Oct. 28, 14,500 Oct. 29, 14,500		No fluid	Nov. 8		Reflexes normal
" 26	Joe S.	23	11 days	Began with chill headache, then severe headache and pain along spine in cervical and lumbar region. Considerable swelling and effusion in left knee.	+	Tenderness. Rigid.		Mild			Normal				Oct. 27, 11,000 Oct. 28, 9,800 Nov. 5, 16,450 Nov. 11, 10,500		Clear fluid Cultures negative.		+	Temperature irregular. Severe chill daily for 20 days since Nov. 3 followed by rise of temp., 103 to 105; no plasmodia found. Quinine without effect; Dec. 5, recovering.
" 29	John W.	40		Found unconscious.		Tenderness. Retraction.											Post-mortem. Smears show abundant pus cells and lanceolate diplococci; cultures show pneumococcus.	Oct. 29		
Nov. 14	Jos De G.	35	2 days	Two days ago, severe headache, fever, vomited several times. Chill and severe occipital headache. Delirious, semi-conscious.	+	Some retraction and rigidity.	+	+					Nov. 30, paralysis right arm and leg		Nov. 15, 14,400 Nov. 21, 18,600 Nov. 27, 17,600	x	Nov. 19. Turbid fluid. Diplococci found.	Nov. 30		Nov. 26. Patient improving. Nov. 29, not so well. Nov. 30, unconscious.

NOTE. + = yes.